

USSR/ Analytical Chemistry - General Questions

G-1

Abs Jour : Referat Zhur - Khimiya, No 4, 1957, 11980

tion of the salt is $[\text{Cu}(\text{ClC}_6\text{H}_4\text{NH}_2)_2](\text{IO}_4)_2$. It is in-
soluble in NH_4OH , alkalies and dilute acids, and dissolves
in concentrated acids. Sensitivity of the reaction is of
0.04 mg/ml IO_4^- . The complex salt with III is insoluble
in NH_4OH and dilute acids, slightly soluble in concentrated
acids. Sensitivity of the reaction is of 0.12 mg/ml $\text{S}_2\text{O}_8^{2-}$.
With I, thiocyanates form a brown precipitate; sensitivity
of the reaction is of 0.589 mg/ml SCN^- . In all instances
occurrence of the reaction is not interfered with by ClO_3^- ,
 BrO_3^- , IO_3^- , ClO_4^- , NO_3^- , $\text{B}_4\text{O}_7^{2-}$, SiF_6^{2-} , nor by redicing agents
that react with II, nor by large amounts of certain anions
which form, in this instance, precipitates with I (AsO_4^{3-} -
15 mg/ml, CrO_4^{2-} > 30 mg/ml, PO_4^{3-} > 10 mg/ml,
 $\text{Cr}_2\text{O}_7^{2-}$ 45 mg/ml, S^{2-}).

Card 2/2

fresh Noy, H.T.

✓ Separate determination of ethyl and butyl alcohols in mixture with toluene and water. A. P. Kreskov, S. V. Syavitskii, V. I. Shemyatenkova, and A. M. Kozlovskii. *Zhurnal Khim. Fiz.* 22, 1000-1 (1952). — Heat 8-10 g. sample with 25 ml. Ac_2O and 25 ml. pyridine 2 hrs. on a steam bath, rinse down the flask with distd. H_2O , connect it to a distn. app., and distil. Remove EtOAc at vapor temp. under 80° , collecting it in 2 Erlenmeyer flasks in series, each containing 10 ml. Disconnect the receivers, pour the contents into a titration flask, neutralize with NaOH to methyl red, treat with 100-150 ml. (known vol.) of N NaOH , and saponify as usual. This gives the EtOH content. For total detn. of H_2O groups proceed as above but use carefully measured 5 ml. pyridine and Ac_2O , then det. the amt. of NaOH needed to titrate excess acetylating mixt. BuOH is detd. by difference.

G. M. Kozlovskii

Chem

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PM 8/22

KRESHKOV, A.P.

27
Silicon determination in silicon-organic compounds.
A. P. Kreshkov, S. V. Svyatitskiy, and V. T. Shchuratenkova.
Zashchita Lav. 22, 1425-7 (1958). — The proposed method
of Si detn. in polysiloxanes is based on the decompn. of the
sample with a mixt. of 25% fuming H_2SO_4 with fuming
 HNO_3 contg. 20% oxides, and the calcination of the resid.
 SiO_2 . In the SiO_2 detn. of the alkyl- and aryl-chlorosilanes,
the sample is weighed into a weighed 100-ml. quartz flask
with a ground stopper, 1.5 ml. 25% fuming H_2SO_4 is rapidly
added, the mixt. allowed to stand for 2 hrs., fuming HNO_3
is added dropwise with gentle heating, then enough HNO_3
is added until no more NO fumes are evolved, the acids
evapd., then it is heated in a muffle furnace, cooled, and
weighed. W. M. Steinberg

5
4E4
4E5C(j)
2 May

MT

Reshkov, P.

Distr: 4E4j/4E3d/4E2c(j)

7
Alkylalkoxysilanes. A. P. Ereskov, L. V. Myslaeva,
and L. M. Khamatashvili. U.S.S.R. 165,137, Oct. 26,
1957. The title compounds are obtained from alkylaloxosilanes
and the corresponding alcohols. For better results the alkyl-
aloxosilanes prior to reacting with the alcohols are transformed
into alkylphenylaloxosilanes. M. H. Hersh

pm

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30 mg

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KRESHKOV, A.P.; SAYUSHKINA, Ye.N.

Separation of copper and nickel by ion exchange chromatography
[with summary in English]. Zhur.anal.khim. 12 no.4:559-560 J1-Ag
'57.
(MIRA 10:10)

1.Moskovskiy khimiko-tehnologicheskii institut im. D.I.
Mendeleeva.

(Copper) (Nickel)
(Chromatographic analysis)

KRESHKOV, A. P.

AUTHORS: Kreshkov, A. P., Bork, V. A.

75-6-23/23

TITLE: Photocolorimetric Method for the Determination of the Phenoxy-Group in Organic Silicon Compounds (Fotokolorimetri-cheskiy metod opredeleniya fenoksigrupp v kremniyorgani-cheskikh soyedineniyakh).

PERIODICAL: Zhurnal Analiticheskoy Khimii, 1957, Vol. 12, Nr 6, pp. 764-764 (USSR)

ABSTRACT: The method of the determination of the phenoxy group in organic silicon compounds is based on the hydrolytic separation of the phenoxy-group as phenol and on the subsequent photocolorimetric determination of phenol as blue indophenol. Indophenol is formed by the action of chlorine and bromine water on phenolate in the presence of ammonium hydroxide. The relative error on the determination of the phenoxy-group in tetraphenoxysilane amounts to 0,83%, in phenyl triphenoxy-silane to 0,27% with chlorine water (and 0,1%) with bromine water. There are 2 references, 1 of which is Slavic.

ASSOCIATION: Chemical-Technological Institute imeni D. I. Mendeleev - Moscow (Moskovskiy khimiko-tekhnologicheskii institut imeni D. I. Mendeloyeva).

Card 1/2

Photocolorimetric Method for the Determination of the
Phenoxy-Group in Organic Silicon Compounds.

75-6-23/23

SUBMITTED: January 7, 1957

AVAILABLE: Library of Congress

1. Organic silicon compounds
2. Phenoxy group-Determination
3. Photocolorimetric method-Application

USCOMM-DC-54848

Card 2/2

Distr: 4E4j/4E3d/4E2c(j)

Colloid-chemical processes in the interaction of tetraalkylsilanes with aqueous aluminate solutions. A. P. Kreshkov, L. V. Myshlyayeva, and L. M. Khananbayev. *Kolloid. Zhur.* 10, 418-421 (1967); cf. C.A. 43, 13117d. When an ester $\text{Si}(\text{OR})_4$ was mixed with a soln. of approx. compn. $\text{Na}_2\text{Al}_2\text{O}_3 + \text{aq.}$, a ppt. appeared after t min. When R was Me, t was 1-2. When R was Et, t was, e.g., >60 at the ratios Al:Si greater than 3 and smaller than 0.16, and was short at Al:Si = 1 to 0.5. At Al:Si = 1, t had a max. when the aluminate soln. was dild. with H_2O until the total NaOH concn. was about 10-15%. Temp. increase from 0° to 100° lowered t , e.g. from 1700 to 3. The ratio Al:Si in the ppt. was greater than in the initial soln., and the 1st fractions of the ppt. contained more Al than did the following fractions. A cryst. ppt. had the ratio $\text{Na}_2\text{O}:\text{SiO}_2:\text{Al}_2\text{O}_3:\text{EtOH}$ of 0.93:1:0.1:0.035; its x-ray spacing was similar to those of albite and kaolinite, and its infrared spectrum had lines corresponding to OH, SiO_2 , and NaO bonds. When R was Pr or Bu, t was long, even at 70°.

I. J. Rikerman

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2 MAY
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KRESHKOV, A.P.; KHRAMOVA, V.I.

Influence of silicon organic compounds on the properties of cement
mortar. Trudy MKETI no.24:91-95 '57. (MIRA 11:6)

(Cement) (Silicon organic compounds) (Mortar)

KRESHKOV, A.P.; DARASHKEVICH, M.L.

Synthesis of new silicates from silicon organic compounds as the
starting material. Trudy MEHTI no.24:327-332 '57. (MIRA 11:6)
(Silicon organic compounds)

KRESHKOV, A.P.; MYSHLYAYEVA, L.V.; KHANANASHVILI, L.M.

Interaction of tetraalkoxysilanes and their derivatives with
several classes of inorganic compounds. Trudy MKHTI no.24:333-
347 '57. (MIRA 11:6)
(Silane) (Hydroxides)

KRESHKOV, A.P.
USSR/General Topics /- Methodology, History, Scientific
Institutions and Conferences, Instruction, Problems
Concerning Bibliography and Scientific Documentation. A-1

Abs Jour : Referat Zhur - Khimiya, No 1, 1958, 5.
Author : A.P. Kreshkov, L.V. Myshlyayeva.
Inst : D.I. Mendeleyev Institute of Chemical Technology, Moscow.
Title : Importance of Some Works of D.I. Mendeleyev and A.M.
Butlerov with Reference to Silicon-Organic Compounds.
Orig Pub : Tr. Mosk. khim.-tekhnol. in-ta im. D.I. Mendeleyeva,
1957, vyp. 25, 33-37
Abstract : Bibliography with 12 titles.

Card 1/1

KRESHKOV, A.P.; KARATEYEV, D.A.

Interaction between siliconorganic compounds with phosphorus
oxychloride. Zhur.ob.khim. 27 no.10:2715-2720 0 '57.
(MIRA 11:4)

1.Moskovskiy khimiko-tekhnologicheskoy institut imeni D.I. Mendeleeva.
(Silicon compounds) (Phosphorus compounds)

KRESHKOV, A. P.

Investigation of the reaction between tetraalkoxysilanes and phosphoric anhydride. / A. P. Kreshkov and D. A. Karateva (D. I. Mendeleev Chem.-Technol. Inst., Moscow). Zhur. Priklad. Khim. 30, 1418-21 (1957).—Org. Si-P condensation compds. were obtained by refluxing 3-4 hrs. mixts. of 0.15 mole $\text{Si}(\text{OR})_4$ with 0.03 mole P_2O_5 . The ppt. washed with dry C_6H_6 and dried to const. wt. at 80-85° yielded 35-45%, based on P_2O_5 and 60-65% based on $\text{Si}(\text{OR})_4$, white hygroscopic powder insol. on org. solvents, sol. in warm 0.1N NaOH. Chem. and x-ray analyses as well as infrared spectra of tablets (10 g./g. KBr) gave the following empirical formula of the powders prepd. from different $\text{Si}(\text{OR})_4$: $\text{Si}_4\text{P}_2\text{C}_8\text{H}_{16}\text{O}_8$ from $\text{Si}(\text{OMe})_4$; $\text{Si}_4\text{P}_2\text{C}_8\text{H}_{16}\text{O}_8$ from $\text{Si}(\text{OEt})_4$; $\text{Si}_4\text{P}_2\text{C}_8\text{H}_{16}\text{O}_8$ from $\text{Si}(\text{OPr})_4$; and $\text{Si}_4\text{P}_2\text{C}_8\text{H}_{16}\text{O}_8$ from $\text{Si}(\text{OBu})_4$. The straight chain structural formulas obtained from Debyeograms are given. I. Bencowitz

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24/10/57

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4/15/1977, 4.15

AUTHORS: Kreshkov, A.P., Mikhaylenko, Yu.Ya., Kirichenko, E.A. 76-12-13/27

TITLE: Investigation on Highly Molecular Silicon-Organic Compounds According to the Method of Infrared Spectroscopy (Issledovaniye vysokomolekulyarnykh kremniyorganicheskikh soedineniy metodom infrakrasnoy spektroskopii).

PERIODICAL: Zhurnal Fizicheskoy Khimii, 1957, Vol. 31, Nr 12, pp.2690-2696 (USSR)

ABSTRACT: Infrared absorption spectra of aniline formaldehyde-resin and of highly molecular silicon-organic compounds, which were obtained on the basis of the interaction of original products with the condensation of aniline and formaldehyde with trimethylchlorosilane and dimethyldichlorosilane, as well as of the original products with the condensation of glycerine and phthalanhydride with diphenyl-silandiol, trimethylchlorosilane, dimethyldichlorosilane and tetraethoxysilane are investigated here for the first time. It was stated that between the molecules of the aniline-formaldehyde-resin and the molecules of dimethyldichlorosilane and of the trimethylchlorosilane, as well as between the molecules of glyphthal-resin and the molecules of diphenylsilandiol, trimethylchlorosilane, dimethyldichlorosilane and tetraethoxysilane a chemical process takes place. This process is caused by the interaction of hydroxyl-groups of highly molecular

Card 1/2

Investigation on Highly Molecular Silicon-Organic Compounds
According to the Method of Infrared Spectroscopy

76-12-13/27

organic compounds with active atoms or functional groups of silicon-organic original compounds. There are 15 figures, and 17 references, 6 of which are Slavic.

ASSOCIATION: Chemical-Technological Institute named D.I. Mendeleev, Moscow
(Khimiko-tekhnologicheskii institut imeni D.I. Mendeleeva, Moskva).

SUBMITTED: October 7, 1956

AVAILABLE: Library of Congress

Card 2/2

YAROSLAVTSEV, Anatoliy Anatol'yevich; KRESHKOV, A.P., red.; STUPNIKOVA,
N.I., red.; SHPAK, Ye.G., tekhn.red.

[Collection of problems and exercises in analytical chemistry]
Sbornik zadach i uprazhnenii po analiticheskoi khimii. Pod
red. A.P.Kreshkova. Moskva, Gos. nauchno-tekhn.izd-vo khim.lit-ry,
1958. 200 p. (MIRA 12:2)
(Chemistry, Analytical--Problems, exercises, etc.)

153-58-1-9/29

AUTHOR: Kreshkov, A.P.

TITLE: Use of Organic Reagents in Anion-Analysis (Primeneniye organicheskikh reaktivov v analize anionov)

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Khimiya i khimicheskaya tekhnologiya, 1958, Nr 1, pp. 58-64 (USSR)

ABSTRACT: Since the discovery of the first analytical reactions effected by means of organic reagents (oR)(references 1, 2) the latter are used on a large scale in anorganic analysis. Its advantages are generally known (references 3 to 5). The theoretical bases of the use of oR in this field were elaborated both by Soviet and foreign investigators (references 6 to 14). The number of oR proposed for the determination of the anions remains small in this case (reference 15) by which the usefulness of the present article is substantiated. The methods being elaborated here, are based on the utilization of a) complex cations of metals with addenda, and of the former with cations of organic bases: b) of the oxidative-reductive properties of the anions with their reactions with organic compounds which lead to the formation of dyed products;

Card 1/3

Use of Organic Reagents in Anion-Analysis

153-58-1-9/29

c) of such destructive reactions of the metal complexes by the anions to be uncovered (otkryvayeniye Pl.) which are accompanied by a change of dye of the solution to be investigated. Soluble complex salts of copper, zinc, nickel, mercury and others were produced with the following organic addenda: Benzidine, O-tolidine, aniline, p-chlorine and p-bromine- aniline, o-and p-tolidine, acridine, -and - naphthylamine, 1.5 naphtylidendiamine, thiourea and some others. Organic reagents which are capable of forming intensely dyed compounds due to their oxidation, can be used for the determination of oxidizing and reducing anions. Chlorates, bromates, iodates, nitrates, ferricyanides, arsenates, persulfates and others are determined in this way, in which case some aromatic amines and other compounds were used as organic reagents. Further, the results of the afore-said reactions of the above-mentioned compounds are described in detail. Furthermore, the following belong to them: Organic bases, rivanol, dimethylamino-antipyrine (pyramidon), production of dye by oxidation of the mixture of salicylic acid and formal-

Card 2/3

Use of Organic Reagents in Anion-Analysis

153 -58-1-9/29

dehyde, of mixtures of aromatic amines, by tannin-oxydation and the use of the mercury-diphenyl-carbazone-complex. The substances which may be used for the afore-said reactions, are, besides the above- mentioned, the following: Oxalates, thiocyanates, periodates, iodides, thiosulfates and sulfides. Complex bismuth-compounds with organic bases (rivanol) are equally used. There are 22 references, 18 of which are Soviet.

ASSOCIATION: Moskovskiy khimiko-tekhnologicheskii institut im. D. I. Mendeleyeva. Kafedra analiticheskoy khimii (Moscow Chemical Technological Institute imeni D. I. Mendeleyev, Chair for Analytical Chemistry)

SUBMITTED: October 1, 1957

Card 3/3

AUTHORS: Kreshkov, A. P., Senetskaya, L. P. SOV 1958-58-1-17/46

TITLE: The Determination of Jointly Present Sulfides, Sulfites, and Thiosulfates (Opredeleniye sul'fidov, sul'fitov i tiosul'fatov pri ikh sovmestnom prisutstvii)

PERIODICAL: Nauchnyye doklady vysshey shkoly. Khimiya i khimicheskaya tekhnologiya, 1958, Nr 1, pp. 68 - 72 (USSR)

ABSTRACT: The analysis of mixtures of the salts mentioned in the title is of great practical importance. It is, however, rather difficult. The authors describe a new photometric method of determining sulfides, where their separation from sulfites and thiosulfates is not necessary. The method is based upon the occurrence of a red color which is produced in an interaction of the sulfides with the mercury-diphenyl-carbazone-complex (Ref 6). Probably a triple complex is formed in this connection. It is known (Refs 7,8) that from the measurement of the optical density of the solution in various sections of the spectrum conclusions may be drawn concerning the reaction mechanism. If a triple complex is formed, this is shown by the characteristic properties of the absorption spectrum. The authors plotted absorption curves of equimolar solutions of

Card 1/3

The Determination of Jointly Present Sulfides,
Sulfites, and Thiosulfates

SOV/156 58-1-17/46

a)mercury-diphenyl-carbazone- and b)mercury-sulfide complexes of the formed red compound as well as of an alkaline diphenyl-carbazone solution (Fig 1). According to the peculiarity of the curve a formation of a triple complex of sulfides and the mercury-diphenyl carbazone may be assumed. A calibration curve (Fig 4) was plotted for the quantitative determination of sulfides. The method of the determination of sulfides worked out by the authors is described. According to this method a series of sulfide determinations were carried out in the presence of thiosulfates and sulfites. Table 1 shows that the thiosulfate does not disturb the sulfide determination according to the suggested method. Table 2 gives average values of 3 parallel sulfide determinations in the presence of sulfites. Table 3 shows the results of sulfide determinations in the presence of a thiosulfate-sulfite mixture. Thus the suggested method of determination of sulfide in the presence of thiosulfates and sulfites is sufficiently accurate, not complicated, and may be used as high-speed method for the determination of soluble sulfides of the sulfide sulfur

Card 2/3

The Determination of Jointly Present Sulfides,
Sulfites, and Thiosulfates

SOV 156-58-1-17/46

in minerals, ores, metals, and their alloys, in sulfur
compounds of non-metal elements etc. There are 4 figures,
3 tables, and 8 references, 6 of which are Soviet.

ASSOCIATION: Kafedra analiticheskoy khimii Moskovskogo khimiko-tekhnologicheskogo instituta im. D.I. Mendeleeva (Chair of Analytical Chemistry of the Moscow Institute of Chemical Technology imeni D.I. Mendeleeva)

SUBMITTED: September 17, 1957

Card 3/3

SOV/156-58-2-27/46

AUTHORS: Kreshkov, A. P., Vil'borg, S. S., Drozdov, V. A.

TITLE: Detection of Ferricyanogens in the Presence of Some Oxidizers
(Otkrytiye ferritsianidov v prisutstvi nekotorykh okisliteley)

PERIODICAL: Nauchnyye doklady vysshey shkoly. Khimiya i khimicheskaya
tekhnologiya, 1958, Nr 2, pp. 314-316 (USSR)

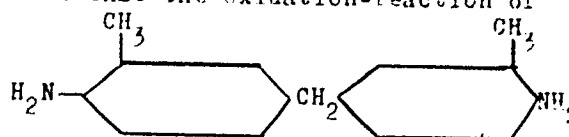
ABSTRACT: At present, such reactions as the formation of Turnbull's blue
(Ref 1), silver-, copper- and other salts of low solubility
(Ref 2), the oxidation reaction of benzidine (Ref 3) and others
are applied for the detection of ferricyanogens. Since all
these reactions show various deficiencies, the reaction pro-
posed by Lapin (Ref 4) is of interest. Also in the work carried
out by the authors it led to a positive result. New sensitive
reactions for ferricyanogens which are based on the oxidation of
amines and amine-mixtures by ferricyanogens, are described in the
present paper. Dyes originate from this. The hydrochloride of
dimethyl-para-phenylene-diamine ought to be taken as first com-
ponent with amine-mixtures. Aniline-, dimethylaniline-, di-
ethylaniline-, o- and p-toluidine, m- and p-nitroaniline-,
sulfanilic- and naphthionic acid, as well as o-naphthylamine

Card 1/3

SOV/156-58-2-27/48

Detection of Ferricyanogens in the Presence of Some Oxidizers

ought to be taken as second components. 4 derivatives of 4,4'-diamino-3,3'-dimethyl-diphenylmethane are used for the oxidation of individual substances, viz. as 5% solutions in glacial acetic acid. The test results are given in tables 1 and 2. As may be seen from table 1, the reaction of the synthesis of the dyes is of low sensitivity when using ferricyanogens. It follows from the data given in table 2 that the oxidation-reaction of the following compound:



has the maximum sensitivity of the 4,7- μ -ferricyanogen-ions. Neither nitrates, chlorates, bromates, iodates, perchlorates, arsenates nor periodates prevent the carrying out of the reaction. On the other hand, nitrites, persulfates, and chromates exercise a disturbing effect. There are 2 tables and 5 references, which are Soviet.

ASSOCIATION: Kafedra analiticheskoy khimii Moskovskogo khimiko-
 tekhnologicheskogo instituta im. D. I. Mendeleeva (Chair of
 Card 2/3 Analytical Chemistry of the Moscow Chemical-Technological

Detection of Ferricyanogens in the Presence of Some Oxidizers

307/156-18-2-1/18

Institute imeni D. I. Mendeleev)

SUBMITTED: September 16, 1957

Card 3/3

SOV/156-58-4-29/49

AUTHORS: Kreshkov, A. P., Bork, V. A., Shvyrkova, L. A.

TITLE: Photometric Determination of Trimethyl Chloro Silane in the Products of the Direct Synthesis of Silico-Organic Compounds (Fotometricheskiy metod opredeleniya trimetilkhlorsilana v produktakh pryamogo sinteza kremniyorganicheskikh soyedineniy)

PERIODICAL: Nauchnyye doklady vysshey shkoly. Khimiya i khimicheskaya tekhnologiya, 1958, Nr 4, pp 727-730 (USSR)

ABSTRACT: A photometric method was worked out for the determination of trimethyl chloro silane in mixtures of other methyl chloro silanes. This method is based on the interaction of trialkyl chloro silane with phosphorus anhydride and the developing ester of the phosphoric acid is converted into molybdenum blue complex. The conversion into molybdenum blue is carried out by means of SnCl_2 . For the construction of the calibration curve, standard benzene solutions of $(\text{CH}_3)_3\text{SiCl}$ with a content of 0.0364 g $(\text{CH}_3)_3\text{SiCl}/\text{ml}$ are used. Detailed working instructions are given. The method can be applied for the determination of

Card 1/2

Photometric Determination of Trimethyl Chloro Silane in the Products of the
Direct Synthesis of Silico-Organic Compounds

SOV/156-58-4-29/49

trimethyl silane in solutions containing 0.1-100% $(\text{CH}_3)_3\text{SiCl}$.
There are 1 figure, 4 tables, and 7 Soviet references.

ASSOCIATION: Kafedra analiticheskoy khimii Moskovskogo khimiko-tekhnologicheskogo instituta im. D. I. Mendeleyeva (Chair of Analytical Chemistry at the Moscow Chemical and Technological Institute imeni D. I. Mendeleyev)

SUBMITTED: May 5, 1958

Card 2/2

KRESHKOV, A. P.

AUTHORS: Kreshkov, A. P., Mikhaylenko, Yu. Ya., 75-1-22/26
Kirichenko, E. A.

TITLE: The Analysis of Silicon Organic Compounds of High Molecular Weight by Infrared Spectroscopy (Analiz vysokomolekulyarnykh kremniyorganicheskikh soyedineniy metodom infrakrasnoy spektroskopii)

PERIODICAL: Zhurnal Analiticheskoy Khimii, 1958, Vol 13, Nr 1, pp 127-133 (USSR)

ABSTRACT: All hitherto known methods of investigating organosilicon compounds by means of infrared spectroscopy are based on the investigation of the infrared spectra of individual substances, where the absorption maxima found characterize certain chemical linkages and groupings of atoms in the molecules of the investigated compound. In an earlier paper the authors reported on the application of infrared absorption spectroscopy for the analysis of monomeric organosilicon compounds. The present article is devoted to the analysis of compounds of high molecular weight which are produced by the union of organosilicon compounds with polymeric organic compounds containing free hydro-

Card 1/4

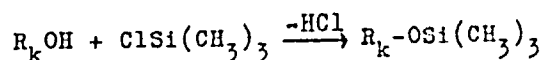
The Analysis of Silicon Organic Compounds of High Molecular Weight 75-1-22/26
by Infrared Spectroscopy

hydroxyl groups in their molecules. Substances were investigated which are obtained by a reaction between condensation products of glycerin and phthalic anhydride or of aniline and formaldehyde on the one hand and trimethylchlorosilane, dimethylchlorosilane and tetraethoxysilane on the other. In this connection it became evident that the chemical analysis according to the method by Verley causes a decrease in the number of free hydroxyl groups in the end products in comparison with any initial products containing hydroxyl groups. The silicon content of the end products was photocolometrically determined. It was found that by the method of infrared spectroscopy a number of analytic signs can be found which permit the determination of certain atom groupings and chemical bonds in the molecules of organosilicon compounds. Thus the structure of the obtained end products can also be determined and the character of the modification brought about by the chemical reaction can be judged. The corresponding measurements were performed in a spectrophotometer of the type MKC-11. It was found that the absorption bands at 3μ (3333 cm^{-1}) can serve as a reliable criterion for the qualitative and quantitative determination

Card 2/4

The Analysis of Silicon Organic Compounds of High Molecular Weight by Infrared Spectroscopy 75-1-22/26

of hydroxyl groups in organosilicon compounds which do not contain any N-H bonds. When N-H bonds are contained in the compound to be investigated, their corresponding bands overlap at $3,00\mu$ (3333 cm^{-1}) with the band caused by the O-H bond. In such cases the determination of the hydroxyl groups according to this method is not possible. In all cases in which alkyl chlorosilane is taken as initial product a new absorption band at $9,5 - 9,6\mu$ ($1050 - 1040\text{ cm}^{-1}$) was found in the spectra of the end products which is absent in the initial products. The presence of this band can only be explained by the formation of a new atom grouping Si-O which shows in the result of the following chemical process:



R_k signifies a complicated organic radical. As the formation of the atom grouping Si-O is always accompanied by the formation of the absorption band at $9,5 - 9,6\mu$ in the spectrum, this band can serve as a criterion for the presence of the Si-O bond in complicated organosilicon compounds.

Card 3/4

The Analysis of Silicon Organic Compounds of High Molecular Weight by Infrared Spectroscopy 75-1-22/26

The spectrophotometer used for taking the infrared spectra is exactly described and the performance of the investigations as well. There are 3 figures, 9 tables, and 16 references, 7 of which are Slavic

ASSOCIATION: Moscow Chemical and Technological Institute imeni, D.I. Mendeleyev (Moskovskiy khimiko-tekhnologicheskiy institut im. D.I.Mendeleyeva)

SUBMITTED: October 12, 1956

AVAILABLE: Library of Congress

1. Silicon compounds (Organic) - Infrared spectroscopy
2. Infrared spectroscopy - Applications

Card 4/4

AUTHORS: Kropshkov, A. P., Mikhaylenko, Yu. Ya., 75-17-2-16/27
Smirenkina, I. P.

TITLE: Spectrophotometric Determination of Naphthalene, α - and β -
-Chloronaphthalene in the Ultraviolet Spectrum Range
(Opredeleniye naftalina, α - i β -khloronaftalina spektrofotometricheskim metodom v ul'trafioletovoy chasti spektra)

PERIODICAL: Zhurnal Analiticheskoy Khimii, 1958. Vol. 13, Nr 2.
pp. 242-245 (USSR)

ABSTRACT: As initial product for the synthesis of α -naphthyltrialkylsilanes serves technical α -chloronaphthalene, which besides small quantities of naphthalene also contains ~10% β -chloronaphthalene. As a consequence to this the products of the synthesis contain admixtures of α -naphthyltrialkylsilane apart from β -naphthyltrialkylsilane. The synthesis takes place at high temperatures and in presence of catalysts, which favour the isomerification of the α - and β -compounds. Consequently the percentage of α - and β -isomers in the obtained products is dependent on the conditions of the performance of the synthesis. Therefore it is of practical interest to find a quantitative determination method for a

Card 1/4

Spectrophotometric Determination of Naphtalene, α - and β -Chloronaphtalene in the Ultraviolet Spectrum Range 79-13-2-15/27

mixture of naphtalene, α - and β -chloronaphtalene, α - and β -naphtyltrichlorosilane, and of α - and β -naphtyltrialkylsilane. In this work a quantitative determination method for naphtalene and α - and β -chloronaphtalene beneath each other is worked out. Because of the resemblance of the chemical properties of the α - and β -isomers chemical methods are hardly applicable for the analysis of their mixtures. A determination on the basis of melting diagrams of the binary system α - and β -chloronaphtalene (references 1-3) was found to be difficult and inaccurate. Besides, the presence of free naphtalene in the mixture complicates this determination very much. The authors applied a spectrophotometric method in the ultraviolet domain of the spectrum for the analysis of mixtures of naphtalene and α - and β -naphtalenes. In the ultraviolet range isomeric naphtalene derivatives show characteristic absorption bands (references 4,5). α -isomers of naphtalene have an absorption band at $314\text{ m}\mu$; while this band in the case of β -isomers is shifted and occurs at ca. $320\text{ m}\mu$. By this it is possible to identify every separate isomer in the mixture. Naphtalene itself has an adsorption band at $310\text{ m}\mu$, which can serve for its identification. The

Card 2/4

Spectrophotometric Determination of Naphtalene, α - and β -
-Chloronaphtalene in the Ultraviolet Spectrum Range

75-13-2-16/27

adsorption measurements were taken on a quartz spectrophotometer of the type SF-4 in a solution of absolute alcohol. As the investigated components obey Beer's law in a concentration range from $1 \cdot 10^{-5}$ mols/l to $5 \cdot 10^{-5}$ mols/l for wave lengths of 310-320 m μ , the formula for the relation between the optical density of the mixture and the optical densities of the components in a certain domain of the spectrum can be applied for the computation of the content of each separate component (ref. 7). It showed up that small admixtures of α -chloronaphtalene in the β -chloronaphtalene, which was used for the determination of the absorption coefficients of the pure components, impair the accuracy of the results only insignificantly. The computation of the percentage of each separate component by the system of equations, consisting of three equations, is given exactly.

Summary: For the quantitative spectrophotometric determination of naphtalene, α - and β -chloronaphtalene in the ultraviolet range of the spectrum the optical densities of the solutions in absolute ethanol are measured at 310, 314, and 320 m μ . There are 1 figure, 3 tables, and 7 references, 3 of which

Card 3/4

Spectrophotometric Determination of Naphtalene, α - and β -
-Chloronaphtalene in the Ultraviolet Spectrum Range

75-13-2-16/27

are Soviet.

ASSOCIATION: Moskovskiy khimiko-tekhnologicheskii institut im. D. I.
Mendeleyeva (Moscow Chemical-Technological Institute imeni
D. I. Mendeleev)

SUBMITTED: October 31, 1956

1. Napthalenes--Determination
2. Napthalenes--Synthesis
3. Spectrophotometers--Performance
4. Ultraviolet spectrum

Card 4/4

AUTHORS: Kreshkov, A. P., Bork, V. A. SOV/75-13-4-25/22

TITLE: The Determination of Alcohol and Phenol Admixtures in Organo-silicon Compounds Containing Ethoxy, Methoxy, and Phenoxo Groups (Opredeleniye primesi spirtov i fenolov v krem-niyorganicheskikh soyedineniyakh, soderzhashchikh etoksi-, metoksi- i fenoksigruppy)

PERIODICAL: Zhurnal analiticheskoy khimii, 1958, Vol. 13, Nr 4, pp. 499-500 (USSR)

ABSTRACT: The authors of the present paper used for the photometric determination of alcohols the reaction described in literature which is based on the capability of the alcohols to dissolve $\text{Fe}[\text{Fe}(\text{SCN})_6]$ under the formation of a red color (Ref 1). Besides, a method was suggested for the determination of alcohol admixtures. It is based on the capability of the alcohols to dissolve methyl violet dye under the formation of a violet colored solution: organosilicon compounds containing alkoxy groups do not dissolve this reagent. $\text{Fe}[\text{Fe}(\text{SCN})_6]$ was used in form of a dry powder. Its production was carried out from potassium thiocyanate and Ferrichloride in absolute methanol

Card 1/3

SOV/75-13-4-25/29

The Determination of Alcohol and Phenol Admixtures in Organosilicon Compounds Containing Ethoxy, Methoxy, and Phenoxy Groups

Calibration curves for the determination of ethanol with $\text{Fe}[\text{Fe}(\text{SCN})_6]$ and with methyl violet were plotted. The photometric measurements were carried out by means of a Pulfrich photometer. The absolute error of the determination of the content of ethanol in tetraethoxy silane or other organosilicon compounds containing ethoxy groups amounts to 0,01% - 0,02%, the relative error to about 1%. This method makes possible the determination of amounts of up to 1,5% alcohol by means of $\text{Fe}[\text{Fe}(\text{SCN})_6]$ and of 1,4 - 5% alcohol when using methyl violet.

The determination with methyl violet was carried out by the authors also for methanol. Phenol can be determined in organosilicon compounds from an aqueous extraction which can be separated from the phenoxy silanes and other organosilicon compounds insoluble in water (Ref 2). The determination of phenol is carried out photometrically on the basis of the coloration with Ferrichloride or with ammoniacal copper salt. The measurements were carried out by means of a Pulfrich photometer. Also for these determinations calibration curves were plotted which are mentioned in the paper. The smallest amount of phenol

Card 2/3

SOV/75-13-4-25/23
The Determination of Alcohol and Phenol Admixtures in Organosilicon Compounds Containing Ethoxy, Methoxy, and Phenoxy Groups

which can be traced in the determination with Ferrichloride is 0,05%, and in the determination of ammoniacal copper salt solution it is 0,015%. The relative error in the determination in either case amounts to 0,7 - 1,4%. The plotting of the calibration curves and the carrying out of the determinations are described in detail. There are 3 figures and 2 references, 2 of which are Soviet.

ASSOCIATION: Moskovskiy khimiko-tekhnologicheskii institut im. D. I. Mendeleyeva (Moscow Chemical and Technological Institute imeni D. I. Mendeleyev)

SUBMITTED: January 9, 1957

1. Silicon compounds (Organic)--Chemical analysis 2. Alcohol--Determination 3. Phenols--Determination 4. Photometry--Applications
5. Methyl violet--Applications

Card 3/3

KRESHKOV, A P

BR

79-1-40/63

AUTHORS: Kreshkov, A. P. , Guretskiy, I. Ya. , Andreyev, P. A.

TITLE: The Conversion of Some Organosilicon Compounds With Cellulose-Nitrates (Vzaimodeystviye nekotorykh kremniyorganicheskikh soedineniy s nitratami tsellyulozy)

PERIODICAL: Zhurnal Obshchey Khimii, 1958, Vol.28, Nr 1, pp.187-193(USSR)

ABSTRACT: The authors had already earlier shown that certain organosilicon compounds enter into reaction with different anorganic and organic compounds which have active atoms or functional groups (H, Cl, OH, OR, NH₂ and others) and yield valuable products. But the conversion processes of the organosilicon compounds with cellulose nitrates had hitherto not been investigated. The present paper proves that, according to the prevailing conditions, the reaction of organosilicon compounds with non-etherified hydroxyl groups of cellulose takes place at the oxygen under the joining of the macromolecules of nitrocellulose by the silicon atoms (see formulae). The authors investigated the conversion of tetramethoxy-, tetraethoxy-, tetra-n-butoxy-, tetra-iso-amylony-, trimethylmethoxy-, diethyl-

Card 1/2

The Conversion of Some Organosilicon Compounds With Cellulose-Nitrates 70-1-4963

diethoxy- and diethyldiethoxy-silane with cellulose nitrates. They investigated the infrared spectra and the swelling heat of the reaction products of organosilicon compounds with the above-mentioned nitrates. It was found that in this process a reduction of the hydroxyl groups belonging to the elementary member of the cellulose molecule and a separation of alcohol takes place. These processes prove that the conversion of alkoxysilanes and alkylalkoxysilanes with cellulose nitrates mainly takes place at the expense of the conversion with non-etherified hydroxyl groups. Under certain conditions a decrease in nitrogen occurs in the reaction products, compared to the initial nitrate of cellulose, as well as a liberation of nitrogen oxides in the reaction process. All this indicates that this conversion probably also takes place at the expense of the superetherified nitrate groups of cellulose. There are 1 figure, 4 tables, and 26 references, 22 of which are Slavic.

ASSOCIATION: **Moscow Chemical-Technological Institute** (Moskovskiy khimiko-
tekhnologicheskii institut)
SUBMITTED: November 27, 1956
AVAILABLE: Library of Congress
Card 2/2 1. Chemistry 2. Organic compounds-Infrared spectra

AUTHORS: SV/1 - 11-0-10/66
 Freshkov, A. P., Mikhaylov, L. V., Khramov, V. I., L. I.
 TITLE: Synthesis of Organosilicon compounds From trialkylsilanes.
 (Polucheniye kremneorganicheskikh oksisoyedineniy iz aminosi-
 lanov) I. Synthesis of the alkyl-alkoxy silanes From alkyl-
 phenyl aminosilanes Which Are Obtained From alkyl-Chloro-
 silanes (I. Polucheniye alkilalkoksisilanov iz alkilfenil-
 aminosilanol, sinteziruyemykh iz alkilkhlorosilanol)
 PERIODICAL: Zhurnal obshchey khimii, 1958, Vol. 28, Nr 8, pp. 2112-2114
 (USSR)
 ABSTRACT: With the further development of the chemistry of organosili-
 con compounds their practical exploitation has as well in-
 creased. The alkyl-alkoxy silanes are used in the practice
 of the modification of various classes of inorganic and or-
 ganic compounds and as semiproducts for the synthesis of the
 high-molecular organosilicon compounds (Ref 1). The following
 synthesis methods of these compounds are known from publica-
 tions: 1) Alkylation of the alkoxy silanes or halogen alkoxy-
 silanes with the aid of organozinc compounds and metallic
 sodium (Ref 2) (2 Schemes). 2) Alkylation of the alkoxy silanes

Card 1/3

107/79-28-3-25/66

Synthesis of Organosilicon Compounds From Aminesilanes. I. Synthesis of the Alkyl-Alkoxy Silanes From Alkyl-Phenyl Aminosilanes Which Are Obtained From Alkyl-Chlorosilanes

or halogen oxyasilanes with the aid of organomagnesium compounds (refs 3-5) or organolithium compounds (refs 6, 7) (2 Scheme). 3) substitution of the hydrogen in alkyl silanes by alkoxy groups in the case of action of alcohols in the presence of lithium-, sodium-, potassium-, and rubidium alcoholate (1 Scheme). 4) etherification of the alkyl halogen silanes with the aid of alcohols (1 Scheme). These methods have, however, certain shortcomings. Only the fourth method can be used economically, though the production of products is accompanied by secondary reactions. The authors worked out a new synthesis method of the alkyl-alkoxy silanes. It consists in the transformation of the alkyl-chloro silanes with aniline with subsequent treatment with the alcohols of the produced alkyl-phenyl amino silanes (both reaction processes are given in the schemes (a) and (b)). The yield for the scheme (a) amounted to 100%, for the scheme (b) to 80 - 95%. There are 12 references, 3 of which are Soviet.

Card 2/3

(4/7)- 120-1000
Synthesis of Organosilicon Oxycompounds From Aminosilanes. I. Preparation
the Alkyl-Alkoxy Silanes From Alkyl-phenyl aminosilanes
From Alkyl-Chlorosilanes

SUBMITTED: July 10, 1957

Card 3/3

KRESHKOV, A.P.; MIKHAYLENKO, Yu.Ya.; MYSHLYAYEVA, L.V.; KHANANASHVILI, L.M.

Investigating the products of the reaction of some silicon organic compounds with water-alkaline solutions of aluminates, stannates, and plumbites by means of infrared absorption spectroscopy. Zhur.prikl. khim. 31 no.11:1746-1749 N '58. (MIRA 12:2)

(Silicon organic compounds--Spectra)
(Spectrum analysis)

76-32-4-17/43

AUTHORS: Kreshkov, A. P., Mikhaylenko, Yu. Ya., Smirenkina, I. P.

TITLE: Investigation of the Ultraviolet Absorption Spectra of Some Organosilicon Compounds (Issledovaniye ultrafioletovykh spektrov pogloshcheniya nekotorykh kremniyorganicheskikh soyedineniy)

PERIODICAL: Zhurnal Fizicheskoy Khimii, 1958, Vol. 32, Nr 4, pp. 834 - 837 (USSR)

ABSTRACT: The ultraviolet absorption spectra within the range of from 220 - 320 mμ of the compounds tetramethoxy-, tetraethoxy-, tetrabutoxy-, tetraisooamyloxy-, tetramethyl- and tetraethylsilane, hexamethyldisiloxane and hexaethyldisiloxane, diphenyldioxysilane, 1,4-di(trimethylsilyl)-1,4-dihydronaphthalene, 1,4-di(triethylsilyl)-1,4-dihydronaphthalene, 1,4-di(tributylsilyl)-1,4-dihydronaphthalene, α-naphthyltributylsilane, α-dinaphthyl-diethylsilane were investigated and it was found that in the spectrum the absorption waves of the saturated organic radicals present in the compound, as there are, tetramethoxy, - tetra-

Card 1/2

76-32-4-17/43

Investigation of the Ultraviolet Absorption Spectra of Some Organosilicon Compounds

ethoxy, etc. could not be observed. The determinations carried out with compounds with the phenyl group (270 mμ), hydronaphthalene group (201 mμ) and naphthalene group (312 mμ) showed the occurrence of the characteristic absorption bands and thus a means of determination of these groups in organosilicon compounds. Special experiments showed an accordance to the rule by Beer within the concentration range up to 0,15 g substance/1000 ml solvent. There are 3 figures, 4 tables and 4 references, 4 of which are Soviet.

ASSOCIATION: Khimiko-tekhnologicheskii institut im. D. I. Mendeleyeva
(Chemical Technological Institute imeni D. I. Mendeleyev)

SUBMITTED: December 25, 1956

AVAILABLE: Library of Congress

Card 2/2 1. Silicon compounds(organic)--Spectrographic analysis 2. Ultraviolet spectrum

AUTHORS: Kreshkov, A. P., Matveyev, V. D., SOV/76-32-2-1/46
Yelincek, V. T., Souchev, I. I.

TITLE: A Thermographic Study of Some Organosilicon Compounds (Issledovaniye nekotorykh kremniyorganicheskikh soyedineniy termograficheskim metodom)

PERIODICAL: Zhurnal fizicheskoy khimii, 1958, Vol 32, Nr 9,
pp 1937 - 1941 (USSR)

ABSTRACT: Impurities in pure materials raise the boiling temperature and change the shape of the boiling-point curves. The authors here suggest a method by which the boiling temperature of the pure solvent may be determined from the thermograms (temperature-time graphs) of dilute solutions. This method is discussed first from a theoretical stand-point and is then illustrated using several examples. The test samples were first heated in a metal block, the temperature being measured by a recording pyrometer of the type used by N.S.Kurnakov. The thermograms of the investigated substances are reproduced (Figs 2-5), and the results are tabulated.

Card 1/2 The following solutions were investigated: aqueous solution

A Thermographic Study of Some Organosilicon Compounds SOV/76-32-9-1/46

of potassium chloride; hydroquinone in ethyl alcohol; oxalic acid in methyl alcohol; diphenyl in benzene; tetrabutoxy silane in tetraethoxy silane; and a tetraethoxy silane solution of the vat residue which remained after the distillation of the tetraethoxy silane. The method cannot be used if the impurity forms an azeotropic mixture in the solvent, or if the impurities are volatile. There are 5 figures, 1 table, and 4 references, 4 of which are Soviet.

ASSOCIATION: Khimiko-tekhnologicheskii institut im.D.I.Mendeleyeva, Moskva
(Moscow Chemical-Technological Institute imeni D.I.Mendeleyev)

SUBMITTED: January 29, 1957

Card 2/2

KRESHKOV, A. P.

V. N. Khranova and A. P. Kreshkov, "Raising the Cement Frost-resisting Properties."

Report presented at the Second All-Union Conference on the Chemistry and Practical Application of Silicon-Organic Compounds held in Leningrad from 25-27 September 1958.

Zhurnal prikladnoy khimii, 1959, Nr 1, pp 238-240 (USSR)

KRESHKOV, A.P.

S.V. Syavtsillo, Ye.A. bondarevskaya, A.P. kreshkov, B.M. Luskina, A.P. Terent'yev, V.T. Shemyatenkova, and L.M. Shtifman, "The Analysis Methods of Monomer and Polymer Compounds."

Report presented at the Second All-Union Conference on the Chemistry and Practical Application of Silicon-Organic Compounds held in Leningrad from 25-27 September 1958.

Zhurnal prikladnoy khimii, 1959, Nr 1, pp 238-240 (USSR)

KRESHKOV, A. P.

N. Ya. Guretskiy, A. P. Kreshkov and P. A. Andreyev, "The Methods of Combining Silicon-Organic Polymers with High-molecular Organic Substances."

Report presented at the Second All-Union Conference on the Chemistry and Practical Application of Silicon-Organic Compounds held in Leningrad from 25-27 September 1958.

Zhurnal prikladnoy khimii, 1959, Nr 1, pp 23⁸-240 (USSR)

5(0)

AUTHORS:

Kreshkov, A. P., Keshishyan, T. H.,
Myshlyayeva, L. V., Khananashvili, L. M.

SOV/72-59-4-3/21

TITLE:

Investigation and Application of Synthetic Organic Silicates
(Issledovaniye i primeneniye iskusstvennykh organicheskikh
silikatov)

PERIODICAL:

Steklo i keramika, 1959, Nr 4, pp 11-14 (USSR)

ABSTRACT:

The theoretical bases of the formation of organic silicates are shown in the papers by A. P. Kreshkov, A. N. Chivikova, V. A. Matveyev, G. N. Nessonova, M. L. Darashkevich (Ref 1). The synthetic silicates have a number of valuable properties: good adhesion to glass, metal, asbestos, tissues, and abrasives. They may be used for the production of films for glass and metal which do not break in heating and they are also highly acid-proof. The products which are obtained on the basis of alkylalkoxy-silanes are characterized by a good solubility in water. Their aqueous solutions are used as hydrophobic impregnations of building material. A. P. Kreshkov, L. V. Myshlyayeva, L. M. Khananashvili (Ref 2) carried out their spectrum and X-ray structural analyses as well as the microcrystallographic investigation. Since it is possible to use

Card 1/2

Investigation and Application of Synthetic Organic
Silicates

SOV/72-59-4-3/21

the obtained products as glues and coatings at high temperatures their behaviour in heating was thermographically investigated. For this purpose the self-recording pyrometer of the Academician N. S. Kurnakov was used as well as the torsion balance of the VT type. In these investigations the authors refer to the papers by L. M. Khananashvili, L. V. Myshlyayeva, B. M. Mikhalev, V. Ye. Shkol'nyy (Ref 3). The characteristics of the products are given in the table. On figures 1, 3, 5, and 6 the heating curves of the products 1, 2, 5, and 6 are plotted and on figures 2, 4, and 7 the curves of weight in heating of the products 1, 2, and 6 are given. The crystallo-optical investigations were performed on the basis of the paper by D. S. Belyankin, V. V. Lapin, N. A. Toropov (Ref 4). As may be seen from the copyrights of A. P. Kreshkov, L. V. Myshlyayeva, L. M. Khananashvili (Ref 5) the hitherto used skin glue which is a shortage-good may be replaced by a glue on the basis of synthetic silicates for the gluing of tissues to grinding disks. The products obtained may be used in various fields of building and silicate material industry. There are 7 figures, 1 table, and 6 Soviet references.

Card 2/2

5(2), 5(3)

SOV/64-59-5-27/23

AUTHORS:

Kreshkov, A. P., Doctor of Chemical Sciences, Bork, V. A., Candidate of Chemical Sciences, Yarovenko, A. N., Candidate of Chemical Sciences

TITLE:

Theoretical Principles and Calculations in Analytical Chemistry, 2nd Modified and Completed Edition (Approved by the Glavnoye upravleniye tekhnologicheskikh vysshikh uchebnykh zavedeniy MVO SSSR (Main Administration of Technological Colleges MVO USSR)) as a Textbook for Chemical-technological Vuzes and Departments, Soviet Science, M., 1956, 447 Pages, 9 Rubles 25 Copecks

PERIODICAL: Khimicheskaya promyshlennost', 1959, Nr 5, pp 460 - 461 (USSR)

ABSTRACT:

The above book is reviewed and judged negative. The book contains a considerable amount of mistakes, inexact formulations and wrong determinations, possibly due to carelessness or insufficient knowledge of the author. The manuscript of the book was not revised and corrected with the necessary accuracy by the editors. A number of incorrect passages and inadequate explanations are pointed out.

Card 1/1

KRESHKOV, A.P.; KHRAMOVA, V.I.; KARATEV, D.A.

Method for increasing the strength and waterproofness of cement
solutions. Trudy MKHTI no:27:306-314 '59. (MIRA 15:6)
(Cement)

5 (3)

AUTHORS: Kreshkov, A. P., Bork, V. A. (Moscow) SOV/74-28-5-4/7

TITLE: Successes in the Field of Analysis of Organosilicon Compounds
(Uspekhi v oblasti analiza kremniyorganicheskikh soyedineniy)

PERIODICAL: Uspekhi khimii, 1959, Vol 28, Nr 5, pp 576 - 604 (USSR)

ABSTRACT: The publication data on the analysis of organosilicon compounds were generalized in the present paper. Organosilicon compounds are characterized by specific properties which differ from the corresponding hydrocarbons and their analogues to a considerable extent. These properties do not permit to employ the methods used in the analysis of organic substances without corresponding modifications. Sometimes it is necessary to develop completely new methods. In this connection also a certain similarity between the individual organosilicon compounds and organic compounds is to be taken into account. The comparison of physical constants of organosilicon compounds and the constants of the corresponding carbons is of great theoretical and practical importance. The comparison of refractive indices and surface tension permits the conclusion that in this case more complicated relations are concerned than in the case of a comparison of densities with boiling points of the same compounds. Recent-

Card 1/4

Successes in the Field of Analysis of Organosilicon
Compounds

SO7/74-28-5-4/7

ly new methods of quantitative determinations of organosilicon compounds as well as of various substances produced on the basis of them were worked out. It was the first time that general qualitative reactions with organosilicon compounds as well as reactions with individual classes and representatives of these compounds were discovered. (Refs 3-16). Recently many papers by Soviet and foreign research workers dealing with quantitative analyses were published; the subject of the mentioned papers is both elementary analysis of organosilicon compounds and the detection of the functional groups they contain. The decomposition of these compounds - silicic acid is formed in this connection - is brought about by various methods. These methods may be divided into 4 principal groups: A) Methods on the basis of combustion (Refs 17-31); B) Methods of wet oxidation (Refs 10, 23, 33-44); C) Methods on the basis of amalgamation (Refs 10, 20, 45-49); D) Methods on the basis of hydrolytic decomposition (Refs 10, 40, 50-64). The development of the elementary method took the way of completion of all mentioned methods. For determining the functional groups methods are employed that were suggested for the determination of the following types of

Card 2/4

Successes in the Field of Analysis of Organosilicon
Compounds

SOV/74-28-5-4/7

groups: A) alkoxy- and aroxy groups (Refs 4, 65-68); B) hydroxyl groups (Refs 10, 69-78); hydrogen bound with silicon and Si-Si bonds (Refs 10, 40, 79-87); D) acetyl groups (Refs 23, 24, 88-90); E) double and treble bonds (Refs 91, 92); F) phenyl groups directly bound to silicon atoms (Ref 93). The physico-chemical and physical methods of analysis are: 1) photocolometric analysis (Refs 10, 16, 45, 75, 94-103); 2) Molecular spectrum analysis (Refs 10, 104-130); 3) thermographical method (Refs 131-133); 4) titration in anhydrous media (Refs 16, 68); 5) polarographical analysis (Ref 134). Furthermore, several papers deal with the analysis of technical products: 1) analysis of ceramic substances on organosilicon basis (Refs 135, 136); 2) analysis of polysiloxane liquids (Refs 32, 65, 137-138); 3) analysis of several other technical products obtained on organosilicon basis (Refs 139-142); 4) analysis of several mixtures obtained as a result of the synthesis or the decomposition of organosilicon compounds (Refs 143-146). The production control of organosilicon compounds is described by several papers: 1) production control of ethyl- and phenylethoxy siloxanes (Ref 93); 2) control of the direct synthesis of methyl-, ethyl- and phenyl-

Card 3/4

Successes in the Field of Analysis of Organosilicon
Compounds

SOV/74-28-5-4/7

chlorosiloxanes (Refs 51, 93, 108); 3) control of hydrolysis and the condensation processes in the production of polymeric organosilicon compounds (Ref 93); 4) analysis of organosilicon polymers (liquids and varnishes) (Refs 21, 22, 93). The further development of the analysis of organosilicon compounds is the natural consequence of the demands made by production. The existing control methods are no more sufficient for the modern requirements. They are in the first line too slow and in the case of several processes of production there are no satisfactory methods at all. It is impossible to prefer one of the mentioned methods. Only a combination of chemical, physical and physico-chemical methods on the basis of the use of all technical means, gathered by the carrying out of analytical chemistry through several years, may correspond to the requirements made to the methods of analysis. There are 146 references, 84 of which are Soviet.

Card 4/4

AUTHORS: Kreshkov, A.P., Karateyev, B.A. SOV/80-32-2-24/36

TITLE: The Interaction Reactions of Alkylalkoxysilanes With Phosphoric Anhydride (Reaktsii vzaimodeystviya alkilalkoksisilanov s fosfornym angidridom)

PERIODICAL: Zhurnal prikladnoy khimii, 1959, Vol XXII, Nr 2, pp 369-374 (USSR)

ABSTRACT: The interaction of alkylalkoxysilanes with PCl_3 , PBr_3 , PCl_5 , and POCl_3 has been investigated in [Ref. 1 - 8]. At the interaction of dimethyl-di-n-butoxysilane with phosphoric anhydride a silicon-phosphorus-organic substance of the composition $[\text{Si}_2\text{P}_2\text{O}_8(\text{CH}_3)_4]_n$ was obtained. The synthetic product contains the alternating Si-O-P bond. A new method has been developed for producing tris-(trimethylsilyl)-phosphate based on the interaction of trimethylmethoxy-, trimethylmethoxy- or trimethyl-n-butoxy- silanes with phosphoric anhydride. The produced compounds have a favorable influence on the compression resistance and frost resistance of cement

Card 1/2

SC7/EC-32-2-24/56

The Interaction Reactions of Alkylalkoxysilanes With Phosphoric Anhydride

if added in quantities of 0.5 - 1% of the dry substance.
There is 1 table, 1 graph, and 18 references, 5 of which are
Soviet, 6 American, 4 English, 1 German, and 1 Swedish.

SUBMITTED: October 28, 1957

Card 2/2

Z/011/61/018/001/012/014
E112/E453

AUTHORS: Andreyev, P.A., Kreshkov, A.P. and Gureskiy, I. Ya.
TITLE: Some properties of silicone-modified nitrocellulose
surface coatings
PERIODICAL: Chemie a chemická technologie, 1961, Vol.18, No.1, p.33,
abstract Ch 61-451 (Lakokras. Materialy, 1960,
No.1, pp.13-17)
TEXT: The reaction of nitrocellulose with organic silicone
derivatives leads partly to a replacement of OH- by OSi-groups,
and partly to transesterification of the nitric esters, with the
production of high-molecular nitrocellulose derivatives and
containing Si in linear or cross-linked structures. The physical
and mechanical properties of coatings prepared from these polymers
are listed. The modification, by means of organic silicones,
improves the heat and water resistance of the coatings and
increases their strength, adhesion and impact strength.
1 diagram, 1 table, 19 literature references.

[Abstractor's note: Complete translation.]

Card 1/1

5.5400

AUTHORS: Kreshkov, A. P., Drozdov, V. A.,
Vlasova, Ye. O.

69667
S/153/60/003/01/021/058
B011/B005

TITLE: Potentiometric Titration of Nitrogen-containing Organosilicon
Compounds in Aqueous Media

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Khimiya i khimicheskaya
tekhnologiya, 1960, Vol 3, Nr 1, pp 80-84 (USSR)

TEXT: The authors worked out a new method for the quantitative determination of the compounds mentioned in the title. It is based on titration with HClO_4 solution in acetic acid in acetonitrile- and nitromethane medium as well as in mixtures of the two latter with benzene and dioxane. The method is simple, quick, and sufficiently accurate. It can be recommended for practical purposes. The authors' experiments showed that sticky products with high adsorbing capacity are formed by titration of nitrogen-containing organosilicon compounds (OSC) in the anhydrous CH_3COOH medium. Besides other undesired processes, various complications are brought about. In the method suggested by the authors, however, the interaction of the substance to be analyzed with the solvent is eliminated. The glass electrode gives constant data. Finally, not only the OSC themselves but also most of their reaction products are soluble in acetonitrile with the titration reagent.

Card 1/3

Potentiometric Titration of Nitrogen-containing
Organosilicon Compounds in Nonaqueous Media

S/153/60/003/01/021/058
B011/B005

This avoids any complication in working with the glass electrode. As an additional solvent, the authors successfully used benzene, dioxane, and CCl_4 . Thus, the potential jumps become more distinct, and the color change of the indicator becomes more intensive. The following OSC were investigated: 1) Trimethyl-(phenyl-amino)-silane, 2) dimethyl-di-(phenyl-amino)-silane, 3) methyl-tri-(phenyl-amino)-silane, 4) hexamethyl-disil-amine, 5) hexamethyl-cyclo-trisil-triamine, 6) octamethyl-cyclo-tetrasil-tetraamine, 7) methyl-(phenyl-amino-methyl)-di-methoxysilane, 8) methyl-(phenyl-amino-methyl)-diethoxysilane, 9) methyl-(ethyl-phenyl-amino-methyl)-dimethoxysilane, 10) methyl-(diphenyl-amino-methyl)-diethoxysilane, and 11) di-[dimethyl-(phenyl-amino-methyl)]-siloxane. They belong to 2 types: a) with nitrogen which is directly bound to silicon atoms, and b) with nitrogen as a component of the organic radicals. The former were synthesized, those of type b) were supplied by the laboratoriya kremnesoderzhashchikh sovedineniy INEOS AN SSSR (Laboratory of Silicon-containing Compounds of the Institute of Elemental-organic Compounds AS USSR). Table 1 shows the structural formulas and boiling points of the compounds 1-11. The OSC were also titrated with addition of the following indicators: crystal violet, thymol blue, bromocresol purple, bromophenol blue, cresol red, methyl red, dimethyl orange,

Card 2/3

69667

Potentiometric Titration of Nitrogen-containing
Organosilicon Compounds in Nonaqueous Media

S/153/60/003/01/021/058
B011/B005

and dimethyl-aminoazobenzene. It was shown that the OSC in the solvents mentioned have stronger basic properties than ammonia in the same medium. There are 2 figures, 2 tables, and 10 references, 6 of which are Soviet.

ASSOCIATION: Moskovskiy khimiko-tekhnologicheskii institut im. D. I. Mendeleyeva;
Kafedra analiticheskoy khimii (Moscow Institute of Chemical
Technology imeni D. I. Mendeleyev; Chair of Analytical Chemistry)

SUBMITTED: April 6, 1959

Card 3/3

5.5400
AUTHORS:

Kreshkov, A. P., Drozdov, V. A.,
Vlasova, Ye. G.

69668
S/153/60/003/01/022/058
B011/B005

TITLE:

Potentiometric Titration of Individual Alkylchlorosilanes With
Organic Bases in Acetonitrile Medium

PERIODICAL:

Izvestiya vysshikh uchebnykh zavedeniy. Khimiya i khimicheskaya
tekhnologiya, 1960, Vol 3, Nr 1, pp 85-87 (USSR)

TEXT: The authors stated in their paper that trimethylchlorosilane, dimethyl-
dichlorosilane, methyltrichlorosilane, and silicon tetrachloride can be success-
fully titrated by potentiometric and visual methods with pyridine, dimethyl-
aminoantipyrine, and nitron (diphenyl-endanylo-dihydro-triazol) in an aceto-
nitrile medium (CH_3CN). The high dielectric constant of CH_3CN (38.3) makes it
possible to attain constant potential values. In the titration of $(\text{CH}_3)_2\text{SiCl}_2$
with dimethylaminoantipyrine, the authors tried to attain the maximum potential
jumps, and added C_6H_6 , $\text{C}_6\text{H}_5\text{CH}_3$, $\text{C}_6\text{H}_5\text{Cl}$ and CCl_4 for this purpose. All these
solvents have a much lower dielectric constant than CH_3CN . The authors studied
the influence of these substances on the character of the titration curves.
Figure 1 shows the cell used for the titration of alkylchlorosilanes. Figures
2-4 show the curves of potentiometric titration of individual methylchloro-

Card 1/2

69668

Potentiometric Titration of Individual
Alkylchlorosilanes With Organic Bases in
Acetonitrile Medium

S/153/60/003/01/022/058
B011/B005

silanes and of SiCl_4 . The following indicators were used for the visual titration (Table 2) of dimethyldichlorosilane with dimethylaminoantipyrine in CH_3CN medium: crystal violet, dimethylaminoazobenzene, bromocresol purple, dimethyl orange, bromophenol blue, gallomarine light-blue, xlenol. Figures 2-4 show that the quantity of the reagent used for the titration of individual methylchlorosilanes and SiCl_4 directly depends on the number of chlorine atoms contained in the respective alkylchlorosilane. The greatest titration jump is characteristic of trimethylchlorosilane, the smallest of SiCl_4 . In both titration methods, the maximum error is $\pm 0.3\%$. There are 4 figures, 1 table, and 8 references, 6 of which are Soviet.

ASSOCIATION: Moskovskiy khimiko-tekhnologicheskii institut im. D. I.
Mendeleyeva; Kafedra analiticheskoy khimii (Moscow Institute of
Chemical Technology imeni D. I. Mendeleyev; Chair of Analytical
Chemistry)

SUBMITTED: February 25, 1959

Card 2/2

86148

S/153/60/003/003/012/036/XX
B016/B058

55300

2209

AUTHORS:

Kreshkov, A. P., Bork, V. A.

TITLE:

Color Reactions for Organosilicon Compounds and Their Use
for Photometric Analysis

PERIODICAL:

Izvestiya vysshikh uchebnykh zavedeniy. Khimiya i
khimicheskaya tekhnologiya, 1960, Vol. 3, No. 3,
pp. 410 - 415

TEXT: The authors report on color reactions developed by them, as well as photometric methods for determining organosilicon compounds. The latter methods are based on the application of the reactions mentioned. This study was mainly conducted because the analysis methods of organosilicon compounds still cannot keep up with their synthesis. The usual methods for organic compounds are therefore difficult to apply. The following peculiarities of organosilicon compounds were utilized for the analysis methods described here: 1) their tendency towards hydrolysis, accompanied by intermolecular condensation; 2) the reactivity of some

Card 1/3

86148

Color Reactions for Organosilicon Compounds and Their Use for Photometric Analysis S/153/60/003/003/012/036/XX
B016/B058

highly mobile atoms of the functional groups combined with silicon (Hal, -OR, H, -NH₂, -SR, -CN, -SCN); 3) the great stability of the C-Si bond. At the same time use was made of a certain similarity of the organosilicon compounds with their organic analogs. In conclusion the authors describe the following qualitative reactions elaborated by them: for amino silane, phenoxysilane, hexa-alkyldisiloxane as well as for HSiCl₃ and SiCl₄. They also elaborated photometric methods for the following organosilicon compounds and their mixtures: a) phenoxy- and ethoxy groups in organosilicon compounds; b) admixtures of ethanol and methanol to methoxy- and ethoxy silanes; c) phenol admixture to phenoxy-silanes; d) for trimethylchlorosilane in the presence of other methyl-chlorosilanes; e) for trichlorosilane and f) for admixtures of SiCl₄ in alkoxysilanes. These photometric methods warrant quick analyses and no reagents difficult to obtain or expensive are necessary. There are 22 Soviet references.

Card 2/3

86148

Color Reactions for Organosilicon Compounds and Their Use for Photometric Analysis S/153/60/003/003/012/036/XX
B016/B058

ASSOCIATION: Moskovskiy khimiko-tekhnologicheskii institut im.
D. I. Mendeleeva; Kafedra analiticheskoy khimii
(Moscow Institute of Chemical Technology imeni
D. I. Mendeleev; Chair of Analytical Chemistry)

SUBMITTED: November 5, 1958

Card 3/3

KRESHKOV, A.P.

Titration of inorganic, organic, and silicon organic substances in
nonaqueous solutions. Dop.AN URSR no.9:1255-1257 '60. (MIRA 13:10)

1. Moskovskiy khimiko-tekhnologicheskoy institut im. D.I.Mendeleyeva.
Predstavleno akademikom AN USSR P.P.Budnikovym.
(Titration)

S/081/62/000/001/024/067
B151/B101

AUTHORS: Kreshkov, A. E., , Drozdov, V. A., Vlasova, Ye. G.,
Kubiak, S.

TITLE: Determination of organosilicon compounds by titration
in a non-aqueous medium

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 1, 1962, 158,
abstract 1D158 (Vestn. tekhn. i ekon. inform. N.-1.
in-t tekhn.-ekon. issled. Gos. kom-ty Sov. Min. SSSR
po khimii, no. 10, 1960, 29-32)

TEXT: Methods are described for the analysis of alkyl(aryl) chlorosilanes
(ACS), alkyl(aryl) (alkoxy)aminosilanes (AAS) and silamines (SA), based on
their titration in non-aqueous media. It is shown that titration of
non-aqueous solutions of these compounds can be carried out using indicators,
potentiometry, conductivity measurement and high frequency methods. ACS are
titrated in a medium consisting of mixed solvents; $\text{CH}_3\text{CN} - \text{C}_6\text{H}_6$ (1 : 1) with
0.1 - 0.05 M acetonitrilic solutions of nitron (diphenylendaniolhydrotriazole) /

Card 1/2

S/081/62/000/001/024/067
B151/B101

Determination of organosilicon ...

(I) and pyridine (II) or 0.1 - 0.05 M benzene solution of dimethylamino-antipyrine (III) in the presence of the usual indicators (crystal violet, dimethyl amino azo benzene, bromocresol purple etc.). The titer of solution I is determined using an accurately weighed sample, while that of solution II is determined using HClO_4 . The best results are obtained by titrating with solution III. With potentiometric determination the ACS is titrated with solution III using glass and calomel electrodes. The error of the method is $\pm 0.5\%$. Conductometric determination gives the best results by titrating the ACS with 0.1 M benzene solution of III; error of the method $\pm 0.5\%$. The differential conductometric titration of a mixture of methylchlorosilanes (MCS) is based on a preliminary quantitative conversion of the MCS by the action of NH_4SCN into methylthiocyanate substituted products (MTS) and subsequent conductometric titration of the MTS with solution III in a medium consisting of acetonitrile and diethyl ether. (Abstracter's note: Complete translation.)

Card 2/2

S/075/60/015/003/031/033/XX
B005/B066

AUTHOR: Kreshkov, A. P.
TITLE: Review of the Book by N. A. Izmaylov: "Elektrokhimiya rastvorov" ("Electrochemistry of Solutions")
PERIODICAL: Zhurnal analiticheskoy khimii, 1960, Vol. 15, No. 3, pp. 380-381

TEXT: The present paper is a critical review of the book by N. A. Izmaylov "Elektrokhimiya rastvorov" ("Electrochemistry of Solutions"), which appeared in 1959 in the publishing house of the KhGU (Khar'kov State University) in an edition of 10000 copies. This book with 958 pages is intended as an educational aid in the course on the electrochemistry of solutions which has been directed by the author for several years at the Khar'kovskiy universitet (Khar'kov University). The monograph gives a synopsis of the results of investigations carried out by the author over many years in the field of non-aqueous electrolyte solutions. The investigation of this class of solutions which recently acquired considerable importance for the analytical chemistry, is treated in the book with

Card 1/3

Review of the Book by N. A. Izmaylov:
 "Elektrokhimiya rastvorov" ("Electro-
 chemistry of Solutions")

S/075/60/015/003/031/033/XX
 B005/B066

particular emphasis. N. A. Izmaylov proceeds from the fact that the division of the electrolytes into strong and weak ones refers only to the state of the electrolyte in the respective solution and therefore does not represent a general classification. The same substance may behave as non-electrolyte, strong or weak electrolyte, according to the nature of the solvent. In this connection the dissociation of acids, bases and salts is considered in the book under review from a uniform standpoint which has been worked out by the author in recent years. Contrary to most of the existing quantitative theories on electrolytic dissociation N. A. Izmaylov does not regard the solvent as medium in which the ions react, but considers the reactions of ions and molecules of the dissociating substance with the solvent. This uniform quantitative theory of electrolytic dissociation was developed by N. A. Izmaylov under the influence of D. I. Mendeleev. The book reviewed gives a systematic interpretation of the modern theory on the electrochemistry of solutions. A characteristic feature of the book is a close connection of scientific theories and the solution of important practical problems. The book will appeal to many chemists, particularly for the interpretation of the modern theory of solutions. The shortcomings of the monograph are its extent which is too

Card 2/3

Review of the Book by N. A. Izmaylov:
"Elektrokhimiya rastvorov" ("Electro-
chemistry of Solutions")

S/075/60/015/003/031/033/XX
B005/B066

voluminous, numerous typographical errors and too many mathematical formulas. These formulas use many different designations whose listing alone takes 7 pages. Some statements are found in the book that are open to dispute. The author of the present critical review deals with two of such passages more thoroughly. The monograph contains some repetitions which ought to be eliminated in further editions. It is however pointed out that all these shortcomings are of no essential importance and do not reduce the scientific value of the book. The author recommends the reading of the book under review particularly to analytical chemists, as it promotes the further development of the theory of analytical chemistry and of the chemical and physical chemical analytical methods. This monograph by N. A. Izmaylov doubtless represents a manual for teachers of physical and analytical chemistry, for scientific workers in analytical laboratories and for students and aspirants of schools of higher education.

Card 3/3

S/075/60/015/005/003/004
B005/B064

AUTHORS: Kreshkov, A. P., Shemyatenkova, V. T., Syavtsillo, S. V.,
Palamarchuk, N. A.

TITLE: Determination of Phenyl Radicals¹ in Organosilicon Compounds

PERIODICAL: Zhurnal analiticheskoy khimii, 1960, Vol. 15, No. 5,
pp. 635-638

TEXT: The authors of the present paper developed a new method of quantitative determination of phenyl groups in organosilicon compounds. It is based on the ethylation of the respective compound with ethyl bromide in the presence of anhydrous aluminum chloride. This ethylation may take place according to two mechanisms: in one mechanism the Si - C bond is ruptured under the action of $AlCl_3$ and an organoaluminum compound forms, that is stepwise ethylated. This ethylation proceeds until the step of hexaethyl benzene is reached. In the other mechanism, under the action of $AlCl_3$, an alumo-organosilicon compound forms, that is ethylated by ethyl bromide. The Si - C bond is solved under the formation of hexaethylene benzene. The reaction schemes of both mechanisms are given.

Card 1/3

Determination of Phenyl Radicals in
Organosilicon Compounds

S/075/60/015/005/003/004
B005/B064

Hexaethyl benzene is obtained with slight impurities of other ethylating benzene derivatives (Ref. 10) if the reaction products are saponified with water. From the amount of the hexaethyl benzene, it is possible to draw conclusions to the content of phenyl groups in the initial organosilicon compound. Since hexaethyl benzene has a high molecular weight and is not volatile, extremely accurate results are obtained from this determination. If constant conditions are observed in ethylation, also the reproducibility of the results is good. The method described is suited for determining benzene and its derivatives in purely organic compounds. The authors investigated phenyl trichlorosilane, methyl phenyl dichlorosilane, polyphenyl siloxane, polymethyl-phenyl siloxane and other organosilicon compounds with phenyl groups directly bound to silicon. Ethyl bromide serves at the same time as solvent in the reaction. 6-7 g anhydrous aluminum chloride and 35-40 g ethyl bromide are taken for 2-2.5 g of the organosilicon compound to be investigated in the analysis of compounds with one phenyl radical per structural unit. Ethylation is carried out at 30°C and is finished after two hours. After the decomposition of the reaction products with water, the ethyl derivatives of benzene are extracted with slight amounts of ether. The extract is washed with water until neutral

Card 2/3

Determination of Phenyl Radicals in
Organosilicon Compounds

S/075/60/015/005/003/004
B005/B064

reaction is reached, then ether and the excess ethyl bromide are distilled off. The residue is dried in the vacuum exsiccator over P_2O_5 . After recrystallization from ethanol or glacial acetic acid hexaethyl benzene is obtained in the form of white prisms melting at $126^{\circ}C$. The formula is given with which the content of phenyl groups in the initial compound can be determined. This formula comprises the ethylation coefficient that was experimentally found by ethylating various chemically pure organosilicon compounds. This coefficient has the value 0.91 ± 0.01 . A table shows the results of determining the phenyl radicals in phenyl trichlorosilane, methyl-phenyl dichlorosilane, polyphenyl siloxane and polymethyl-phenyl siloxane by the method described. The results are reproducible with an accuracy of $\pm 1-1.5\%$ (absolute). A. A. Khvoshchevskaya and L. M. Kharchevnikova took part in the experiments. There are 1 table and 11 references: 6 Soviet, 4 US, and 1 German. ✓

ASSOCIATION: Moskovskiy khimiko-tekhnologicheskii institut im. D. I. Mendeleyeva (Moscow Institute of Chemical Technology imeni D. I. Mendeleyev)

SUBMITTED: July 27, 1959

Card 3/3

S/032/60/026/010/002/035
B016/B054

AUTHORS: Kreshkov, A. P., Drozdov, V. A., and Vlasova, Ye. G.

TITLE: Analysis of Nitrogen- and Carboxyl-containing Organosilicon Compounds by Titration in Non-aqueous Media

PERIODICAL: Zavodskaya laboratoriya, 1960, Vol. 26, No. 10, pp. 1080-1084

TEXT: In contrast to the conventional methods of analyzing nitrogen- and carboxyl-containing organosilicon compounds (Refs. 1,2), the authors developed methods based on potentiometric or visual titration of both types of compounds with perchloric acid or tetraethyl ammonium hydroxide in a medium of solvent mixtures. Both anhydrous acetic acid and acetic anhydride and glycols proved to be unsuitable. The solvent mixtures used were acetonitrile benzene, acetone benzene, or methyl-ethyl ketone benzene in a ratio of 1 : 1. Fig. 1 shows the curves of potentiometric titration for nitrogen-containing compounds of the above-mentioned type in which the nitrogen atoms are directly bound to the silicon atoms. Fig. 2 shows the same kind of titration of the said compounds in which the nitrogen atoms

Card 1/3

Analysis of Nitrogen- and Carboxyl-
containing Organosilicon Compounds by
Titration in Non-aqueous Media

S/032/60/026/010/002/035
B016/B054

are not directly bound to the silicon atoms. The titration is made with 0.1 N solution of perchloric acid in anhydrous acetic acid by means of a tube potentiometer ЛП-5 (LP-5) with glass and calomel electrodes. The point of equivalence is graphically determined. The consumption of titrating reagent is proportional to the number of nitrogen atoms. In titration by use of indicators, the following substances were used: crystalline violet, bromcresol purple, bromphenol blue, cresol red, and dimethyl-amino azobenzene as 0.5% solutions in acetonitrile, further thymol blue, methyl red, and dimethyl orange as saturated solutions in acetonitrile; all these indicators are suitable for visual titration. Fig. 3 shows the points of color change of the indicators in the titration of nitrogen-containing compounds. Curve A holds for substances with nitrogen atoms directly bound to Si atoms, Curve B for cyclic nitrogen-containing compounds, Curve C for compounds in which the nitrogen atoms are not bound to the Si atoms. Table 1 gives the results of a quantitative determination of nitrogen-containing organosilicon compounds. The titration of carboxyl-containing organosilicon compounds is made with tetraethyl ammonium

Card 2/3

Analysis of Nitrogen- and Carboxyl-
containing Organosilicon Compounds by
Titration in Non-aqueous Media

S/032/60/026/010/002/035
B016/B054

hydroxide in a benzene - methanol mixture (according to Ref. 4) on the LP-5 apparatus mentioned. Fig. 4 shows the graphical determination of the point of equivalence. Table 2 lists the results of quantitative determinations of carboxyl-containing compounds and their mixtures with organic acids. There are 4 figures, 2 tables, and 4 Soviet references.

ASSOCIATION: Moskovskiy khimiko-tekhnologicheskii institut im. D. I.
Mendeleyeva (Moscow Institute of Chemical Technology imeni
D. I. Mendeleyev)

Card 3/3

21750
S/079/60/030/04/68/080
B001/B011

5.3700

AUTHORS: Kreshkov, A. P., Myshlyayeva, L. V., Khananashvili, L. M.

TITLE: Investigations in the Field of Aminosilanes. II. Methods of Synthesizing Some Tetraalkoxy Silanes

PERIODICAL: Zhurnal obshchey khimii, 1960, Vol. 30, No. 4, pp. 1347-1350

TEXT: The authors discuss the traditional methods of synthesizing tetraalkoxy silanes (Refs. 1-7). According to Ref. 4, the ternary mixture $\text{Si}(\text{OCH}_3)_4\text{-CH}_3\text{OH-HCl}$ boils at 69° . These components react with one another in two stages: 1) by reaction of HCl with the alcohol, under formation of methyl chloride and water, 2) by the hydrolysis of ester by means of the separated water until the precipitate $\text{nSiO}_2 \cdot \text{mH}_2\text{O}$ is formed. On analyzing the reaction products with a lower boiling temperature than that of SiORCl_3 , the authors found them to contain considerable quantities of tetraalkoxy silanes and alcohol. The change in the composition of low-boiling fractions with temperature is represented in the form of a triangular diagram in the coordinates $\text{Si}(\text{OR})_4\text{-CH}_3\text{OH-HCl}$. Analytical and graphical data were similar for

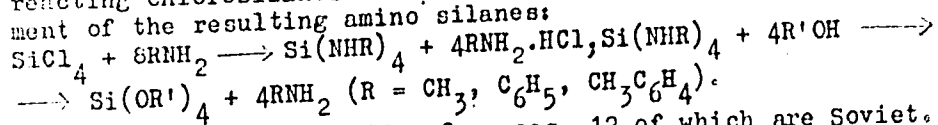
Card 1/3

Investigations in the Field of Aminosilanes.
II. Methods of Synthesizing Some Tetraalkoxy
Silanes

30765

S/079/60/030/04/68/080
B001/B011

some syntheses, which fact made it possible for this diagram to be used for the quick determination of the composition of the mixture by way of determining one component (HCl). Processes were investigated which take place in the synthesis of tetraalkoxy silanes. It was found that some esters of orthosilicic acid can be obtained in much better yields by a complementary treatment of the side products as are obtained in the esterification with SiCl_4 . A new method of synthesizing tetraalkoxy silanes was worked out by reacting chlorosilanes with different amines with a subsequent alcoholic treatment of the resulting amino silanes:



There are 1 figure and 14 references, 12 of which are Soviet.

ASSOCIATION: Moskovskiy khimiko-tekhnologicheskii institut imeni D. I. Mendeleyeva (Moscow Institute of Chemical Technology imeni D. I. Mendeleyev)

Card 2/3

KRESHKOV, A.P.; KARATEYEV, D.A.

Study of the interaction between some chloroalkylalkoxy-
silanes and phosphoric anhydride. Zhur.prikl.khim. 33 no.2:
413-417 F '60. (MIRA 13:5)
(Silane) (Phosphorus oxide)

S/020/60/13:06/32/071
B011/B005

AUTHORS: Kreshkov, A. P., Drozdov, V. A.

TITLE: A Method of Differentiated Conductometric Titration of a Mixture of Methylchlorosilanes in Nonaqueous Solutions

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 131, No. 6, pp. 1345 - 1348

TEXT: The method mentioned in the title for a quantitative determination of alkylchlorosilanes is suggested by the authors. It is quick, accurate, and can be successfully used for analyzing individual alkylthiocyanate silanes and their multicomponent mixtures. Such methods have been missing hitherto. The known methods require a complicated apparatus, have been insufficiently worked out, and have therefore not been introduced in practice. The authors' method is based on a transformation of alkylchlorosilanes into alkylthiocyanate-substituted derivatives. Ammonium thiocyanate is used for this purpose. Subsequently, the alkylthiocyanate silanes are conductometrically titrated with a benzene solution of dimethylaminoantipyrine in acetonitrile-ether medium. The authors studied trimethylchlorosilane, dimethyldichlorosilane, and methyltrichlorosilane, as well as their binary and 3-component mixtures. Figs. 1 and 2 show the curves of the

Card 1/2

A Method of Differentiated Conductometric Titration of
a Mixture of Methylchlorosilanes in Nonaqueous
Solutions

S/020/60/131/06/32/071
B011/B005

conductometric titration mentioned. An analysis of these curves shows that primarily the thiocyanate derivative formed from methylchlorosilane is titrated off, then follows dimethyldithiocyanate silane, and finally methyltrithiocyanate silane, the derivative of methyltrichlorosilane with the highest number of chlorine atoms in the molecule. Table 1 shows the results of quantitative analysis of binary mixtures of methylchlorosilanes. These data prove the accuracy of the method suggested. Table 2 lists results of the same analysis of 3-component mixtures carried out with equal success. There are 2 figures, 2 tables, and 9 references, 5 of which are Soviet.

ASSOCIATION: Moskovskiy khimiko-tekhnologicheskii institut im. D.I. Mendeleeva
(Moscow Institute of Chemical Technology imeni D. I. Mendeleev)

PRESENTED: December 25, 1959, by I. V. Tananayev, Academician

SUBMITTED: December 23, 1959

Card 2/2

KRUSHKOV, A.P.; BYKOVA, L.M.; MKHITARYAN, N.A.

Potentiometric method of titrating acids with quaternary ammonium bases. Dokl.AN SSSR 132 no.5:1090-1092 Ja '60.
(MIRA 13:6)

1. Moskovskiy khimiko-tekhnologicheskii institut imeni D.I. Mendeleeva. Predstavleno akademikom I.V.Tananayevym.
(Potentiometric analysis) (Acids)
(Ammonium compounds)

KRESHKOV, A.P.; BYKOVA, L.N.; SHEMET, N.Sh.

Potentiometric method of differentiated titration of organic bases
in a methyl ethyl ketone medium. Dokl.AN SSSR 134 no.1:96-99
S '60. (MIRA 13:8)

1. Moskovskiy khimiko-tekhnologicheskii institut im. D.I.Mendeleeva.
Predstavleno akad. A.P. Vinogradovym.
(Potentiometric analysis)
(Bases (Chemistry))

TERENT'YEV, A.P., otv.red.; ALIMARIN, I.P., red.; GEL'MAN, N.E., red.;
KLIMOVA, V.A., red.; KRESHKOV, A.P., red.; KUZNETSOV, V.I., red.;
LEVIN, E.S., red.; PODGAYSKAYA, Z.I., red.; RUKHADZE, Ye.G., red.;
TAL'ROZE, V.L., red.; TSUKERMAN, A.M., red.; SHEMYAKIN, F.M., red.;
SHEYNKER, Yu.N., red.; YERMAKOV, M.S., tekhn.red.

[Conference on organic analysis] Soveshchanie po organicheskomu
analizu. Tezisy dokladov. Moskva, Izd-vo Mosk.univ., 1961. 170 p.
(MIRA 14:4)

1. Soveshchaniye po organicheskomu analizu. 1961.
(Chemistry, Analytical--Congresses)
(Chemistry, Organic--Congresses)

KRESHKOV, Anatoliy Pavlovich. Prinyali uchastiye: VIL'BERG, S.S., dotsent, kand. khim. nauk; MIKHAYLENKO, Yu.Ya., dotsent, kand. khim. nauk; YAROVENKO, A.N., dotsent, kand. khim. nauk; STUPNIKOVA, N.I., red.; SHPAK, Ye.G., tekhn. red.

[Principles of analytical chemistry; qualitative and quantitative analysis] Osnovy analiticheskoi khimii; kachestvennyi i kolichestvennyi analiz. Moskva, Gos. nauchno-tekhn. izd-vo khim. lit-ry. Book 2. [Quantitative analysis] Kolichestvennyi analiz. 1961. 552 p. (MIRA 14:10)

(Chemistry, Analytical--Quantitative)

KRESHKOV, Anatoliy Pavlovich. Prinimali uchastiye: VIL'BORG, S.S., dots.,
kand. khim. nauk; MIKHAYLENKO, Yu.Ya., dots., kand. khim. nauk;
YAROVENKO, A.N., dots., kand. khim. nauk; STUPNIKOVA, N.I., red.;
SHPAK, Ye.G., tekhn. red.

[Principles of analytical chemistry; qualitative and quantitative
analysis] Osnovy analiticheskoi khimii; kachestvennyi i koliche-
stvennyi analiz. Moskva, Gos. nauchno-tekhn. izd-vo khim. lit-ry.
Book 1. [Theoretical principles. Qualitative analysis] Teoretiche-
skie osnovy, kachestvennyi analiz, 1961. 635 p. (MIRA 14:9)
(Chemistry, Analytical--Qualitative)

S/661/61/000/006/033/081
D205/D302

AUTHORS: Khananashvili, L. M., Chivikova, A. N., Kreshkov, A. P.
and Darashkevich, M. L.

TITLE: Interaction of alkoxysilanes with inorganic compounds

SOURCE: Khimiya i prakticheskoye primeneniye kremneorganicheskikh soedineniy; trudy konferentsii. no. 6: Doklady, diskussii, resheniye. II Vses. konfer. po khimii i prakt. prim. kremneorg. soyed., Len., 1958. Leningrad, Izd-vo AN SSSR, 1961, 159-161

TEXT: For investigation of the interaction products the thermographic method was applied. The thermogram of the interaction product of methyl triethoxysilane with an aqueous solution of sodium aluminate showed that the product was a chemical compound and not a mixture. Physico-chemical investigations of the interaction products of silico-organic and inorganic compounds allow the conclusion that in their structure and composition they are similar to ordinary

Card 1/2

S/661/61/000/006/033/031
D205/D302

Interaction of alkoxysilanes ...

silicates and can be regarded as synthetic silicates differing from the simple silicates by the presence of organic radicals in their composition. It was stated in the lecture given previously (Proceedings of this Conference, no. 1, p. 178) that in the interaction of trimethyl alkoxysilanes with phosphorous pentoxide tris(trimethylsilyl)phosphate was formed. In fact, in the infrared spectrum of the product the maxima characteristic for the bonds C-H in CH_3 ,

$(\text{CH}_3)_3\text{Si}$ and P-O bond were revealed. M. G. Voronkov (IKhS AN SSSR, Leningrad), R. Kh. Freydlina (INEOS AN SSSR, Moscow) and S. N. Borisov (VNIISK, Leningrad) took part in the discussion. S. N. Borisov mentioned similar work performed by him. There are 4 figures.

ASSOCIATION: Moskovskiy khimiko-tekhnologicheskii institut im. D. I. Mendeleyeva (Moscow Chemical Technological Institute im. D. I. Mendeleyev)

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Card 2/2

S/661/61/000/006/053/031
523//D302

AUTHORS: Guretskiy, I. Ya., Kreshkov, A. P. and Andreyev, P. A.
TITLE: Reaction of organo-silicon compounds with cellulose nitrates
SOURCE: Khimiya i prakticheskoye primeneniye kremneorganicheskikh soyedineniy; trudy konferentsii, no. 6: Doklady, diskussii, resheniye. II Vses. konfer. po Khimii i prakt. prim. kremnorg. soyed., Len. 1958. Leningrad, Izd-vo AN SSSR, 1961, 226-227

TEXT: This is a discussion of the above paper (this publication, no. 2, p. 133) between I. Ya. Guretskiy, P. A. Andreyev, V. I. Pakhomov (NIIPM, Moscow) and M. V. Sobolevskiy (Moscow). The following topics are discussed: The difference in the properties of silicon nitrocellulose compounds and nitrocellulose; the quality of the films; the silicon content of the films. Modified organo-silicon compounds containing cellulose nitrates give films with lower inflammability and a higher temperature of combustion. Compounds

Card 1/2

Reaction of organo-silicon ...

S/661/61/000/006/053/081
D235/D302

with methoxy groups react more readily with cellulose nitrates. The films were tested with respect to the standard for lacquer films and results showed that the hardness was 5 - 8% lower than for nitrocellulose films but the adhesion to glass, brass and steel, elasticity, and impact strength were higher. The silicon content depends on the conditions of combination of the original compounds. Thus combination of cellulose with chemically pure organo-silicon compounds led to a product with a silicon content of 0.15 - 1.0%, combination in the presence of 0.01% SiCl_4 to a content of 0.3 - 7.0% and combination in a heterogeneous medium with 0.01% SiCl_4 to a small fraction containing around 20% silicon.

ASSOCIATION: Moskovskiy khimiko-tekhnologicheskii institut im. D.I. Mendeleyeva (Moscow Institute of Chemical Technology im. D. I. Mendeleyev)

Card 2/2

S/661/61/000/006/055/031
D267/D302

AUTHOR: Kreshkov, A. P.

TITLE: Ways of developing the analysis of organo-silicon compounds

SOURCE: Khimiya i prakticheskoye primeneniye kremneorganicheskikh soyedineniy; trudy konferentsii, no. 6: Doklady, diskussii, resheniye. II Vses. konfer. po khimii i prakt. prim. kremneorg. soyed., Len. 1958. Leningrad, Izd-vo AN SSSR, 1961, 232-234

TEXT: A discussion of the above paper (this publication, no. 3, p. 3) in which Yu. N. Platonov (IKhS AN SSSR, Leningrad), A. P. Terent'yev (MGU), N. E. Gel'man (INEOS AN SSSR, Moscow), V. T. She-myatenkova (Moscow), P. G. Maslov (Leningrad) and V. A. Klimova (IOKh AN SSSR) took part. Usefulness of the 'empty tube' method, advocated by the author, was discussed, as well as the following details: Determination of small Si impurities, preparation of standards, study of physico-chemical characteristics of various organo-
Card 1/2

Ways of developing ...

S/661/61/000/005/055/031
D267/D302

silicon compounds, sample size and combustion techniques.

ASSOCIATION: Moskovskiy khimiko-tekhnologicheskii institut im.
D. I. Mendeleyeva (Moscow Institute of Chemical Tech-
nology im. D. I. Mendeleyev)

Card 2/2

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S/539/61/000/032/017/017
D235/D301

AUTHOR: Kreshkov, A.P.

TITLE: Electrometric methods of analyzing non-aqueous solutions
of monomeric and polymeric silicon-organic compounds

PERIODICAL: Moscow. Khimiko-tekhnologicheskii institut. Trudy, no. 32,
1961. Issledovaniya v oblasti elektrokhemii, 333-341

TEXT: The theoretical basis for studying many silicon-organic compounds in non-aqueous solutions is discussed. The paper is concerned with a variety of compounds: alkyl(aryl) chlorosilanes, alkyl (aryl)aminosilanes, alkyl (aryl) silamines, silanols, carboxyl-containing organosilicon compounds, etc. Acetonitrile, nitromethane, anhydrous acetic acid, acetic anhydride, glycol, methyl ethyl ketone, diethyl ether, etc. are used as non-aqueous solvents. In such solvents the organosilicon compounds exhibit weakly acidic or basic properties. A number of bases can be used for titration, including pyridine, nitron, dimethyl-aminopyrene and tetraethylammonium hydroxide; the latter two were first used by the author. Hydrochloric

Card 1/3